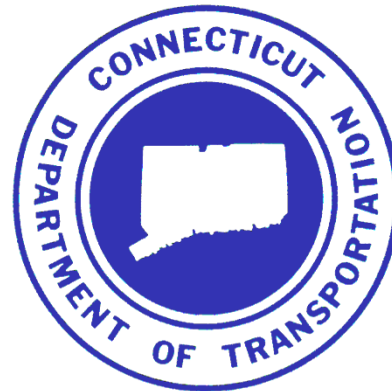


Upgrading a Rotary to a Roundabout

Connecticut's Experience



History of Roundabouts at ConnDOT

- CT had many old Traffic Circles/Rotaries
- Most were replaced in 50's/60's/70's
- DOT officials skeptical of roundabouts
- May, 2003 – Roundabout presentation at ConnDOT
- 2008 – First modern roundabout on State route

West Haven (Before)



CTDOT Project 156-173
Existing Conditions



West Haven (Built - 6/08)



Modification of old rotaries

- Killingworth
- Seymour
- Goshen (design on hold)

Killingworth

NCHRP

REPORT 572

Roundabouts in the United States

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PROGRAM

Table 70. Relationship between crashes and geometry, sorted on crash rates.

	Crash Frequency (crashes/yr)	Crash Rate (crashes/MEV)	Average Number of Lanes in Group	Average Inscribed Circle Diameter	Average Daily Traffic (veh/day)	Average Number of Legs in Group
Total Dataset	4.95	0.75	1.39	133 ft (41 m)	16,606	3.89
First Ten	0.02	0.00	1.20	95 ft (29 m)	9,295	3.70
First Thirty	0.59	0.10	1.23	123 ft (37 m)	14,961	3.73
Bottom Thirty	11.75	1.69	1.70	165 ft (50 m)	20,186	4.07
Bottom Ten	18.51	3.03	1.90	150 ft (46 m)	16,734	4.20

Legend: MEV = million entering vehicles; veh = vehicles

roundabouts, and the research team believes that this is the primary cause for the high crash frequency.

Multilane Roundabout Evaluation

Approximately one-third of the sites in the safety database are multilane roundabouts. However, 8 of the 10 sites with the highest crash frequency were multilane roundabouts. Therefore, it is apparent that at least some multilane roundabouts have abnormally high crash experiences that warrant further investigation.

Review of these sites led the research team to believe that most were not designed using the natural vehicle path concept. This scenario is entirely likely because the majority of these sites were designed and constructed before the publication of the FHWA Roundabout Guide (1), which was the first document to publish this concept. The natural vehicle path concept, shown in Figure 77, was refined in later guidelines such as the Kansas Department of Transportation's *Kansas Roundabout Guide* (37).

Lane widths also appear to have an effect on safety. For example, one roundabout appeared to be designed to

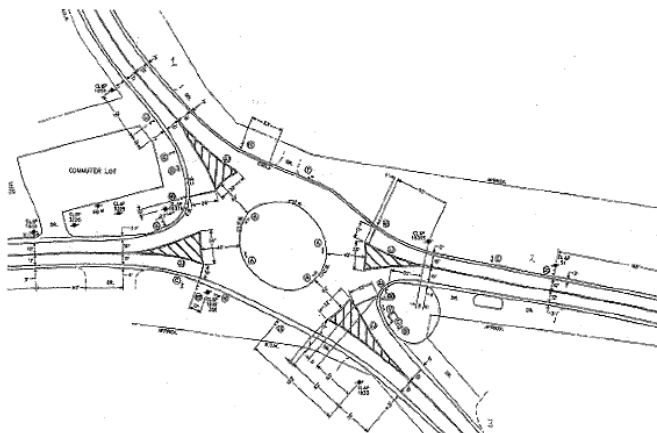


Figure 76. Example of a single-lane roundabout with poor deflection characteristics.

NCHRP 572-Roundabouts in the United States

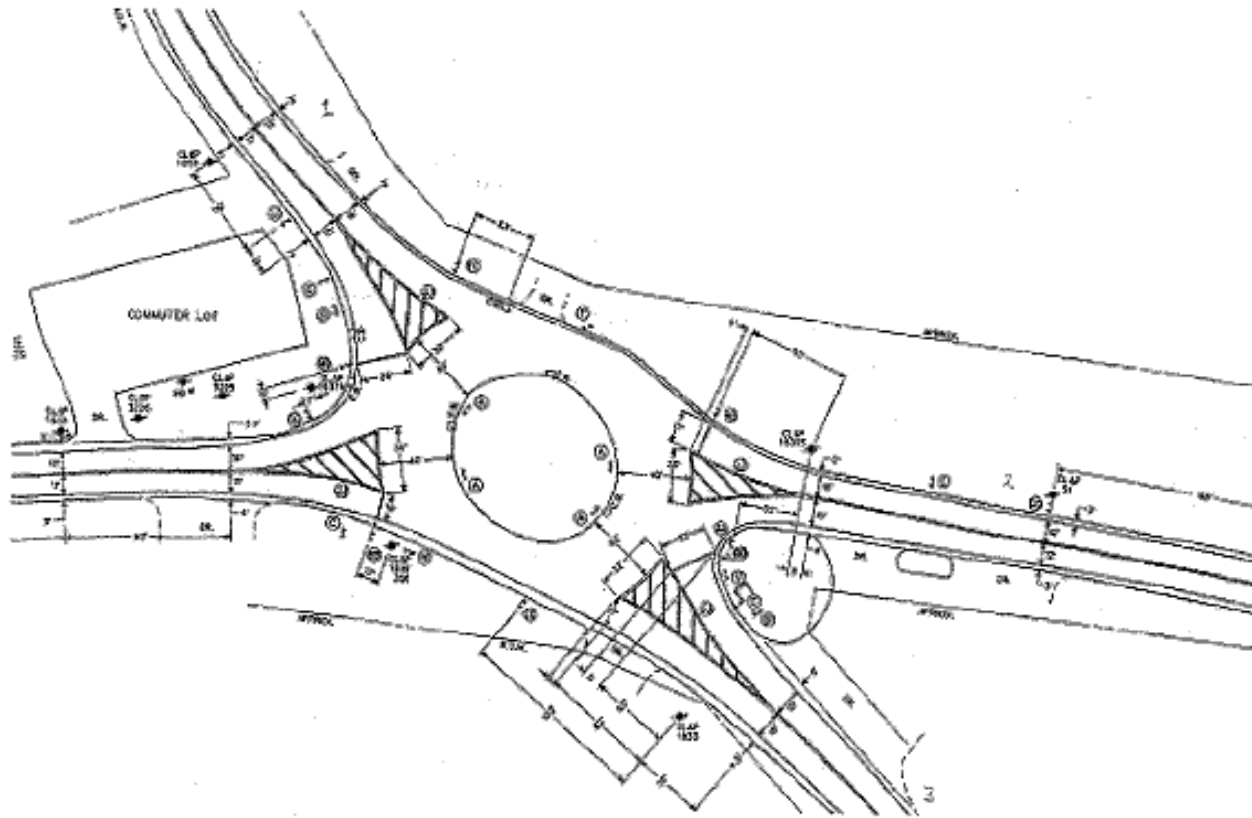


Figure 76. Example of a single-lane roundabout with poor deflection characteristics.

Killingworth (Before)

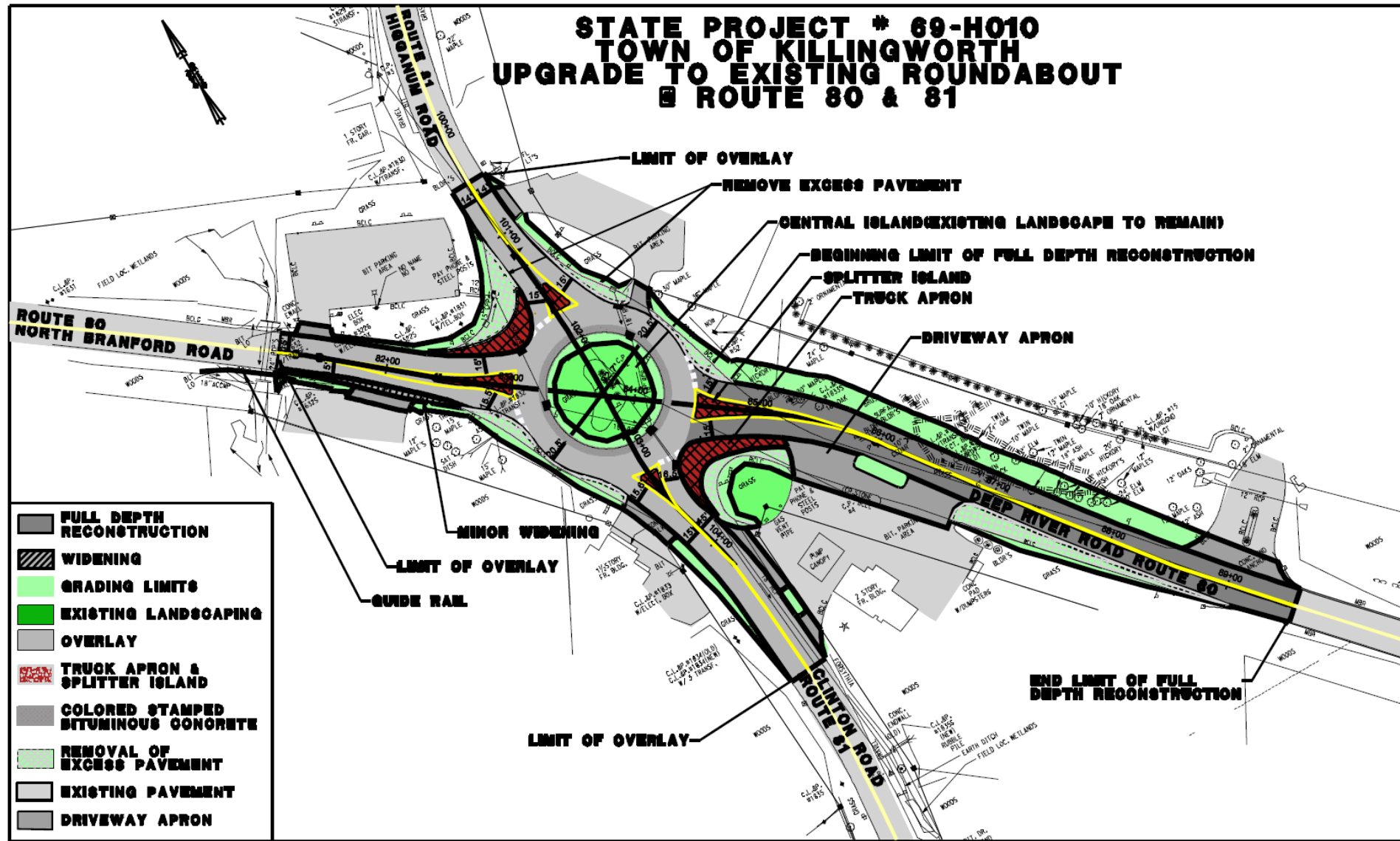


Killingworth

- Low/Moderate volumes
- Little to no deflection
- High speeds
- Relatively few crashes, but most crashes involved injuries

Killingworth Modifications

STATE PROJECT # 69-H010 TOWN OF KILLINGWORTH UPGRADE TO EXISTING ROUNDABOUT @ ROUTE 80 & 81



Killingworth (After)



Killingworth Safety Improvements

- We were unsure of what to expect for crash reductions – (rotary conversion to roundabout)
- Hoped for about 20% reduction
- 3 Years before and after:
 - 50% reduction in crashes
 - 83% reduction in injury crashes
 - **86% reduction in injuries**



Seymour

Seymour – Rte 188 at Rte 334



Seymour – Rte 188 at Rte 334



Lack of Deflection



Northbound Approach



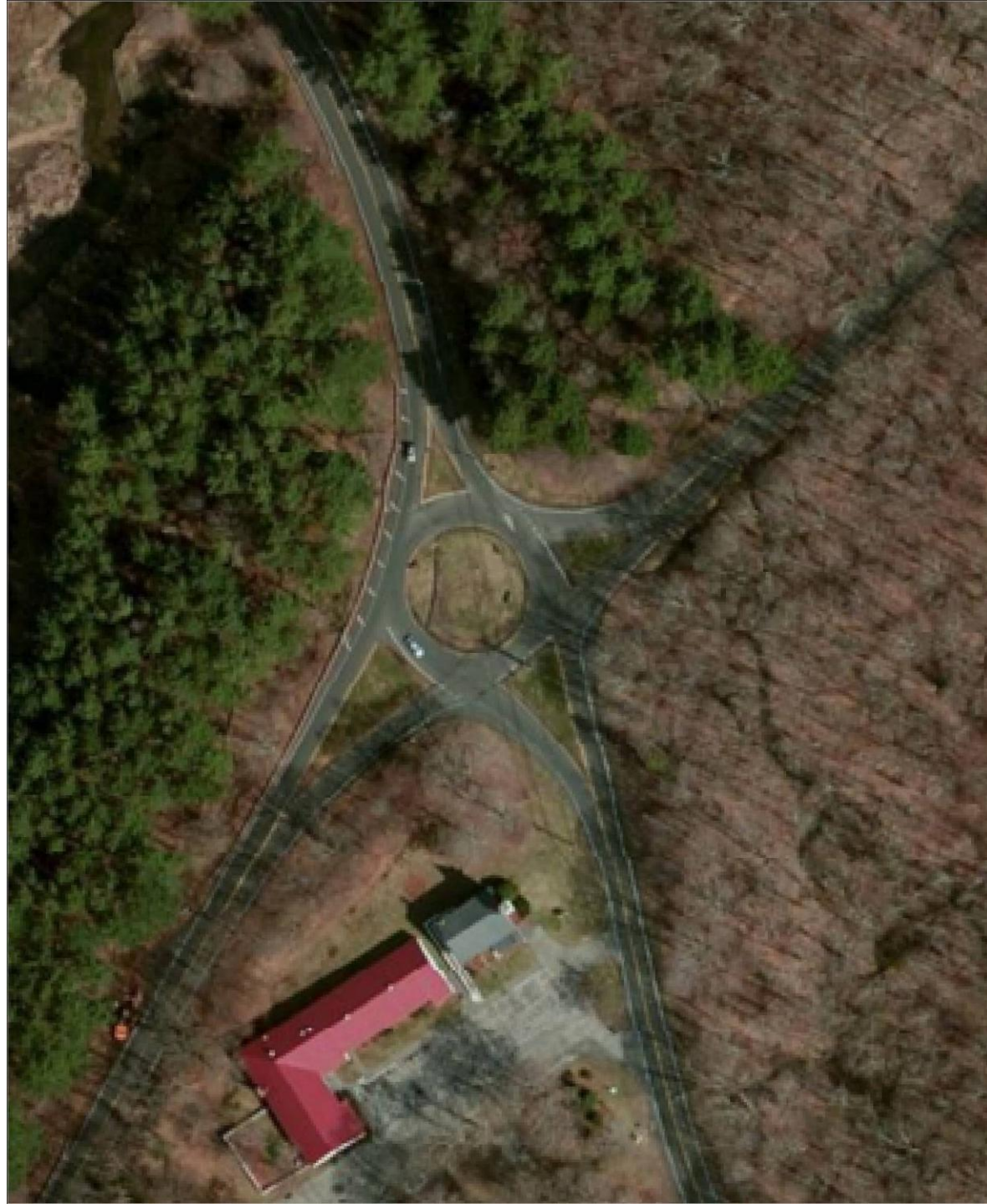
Westbound Approach



Seymour

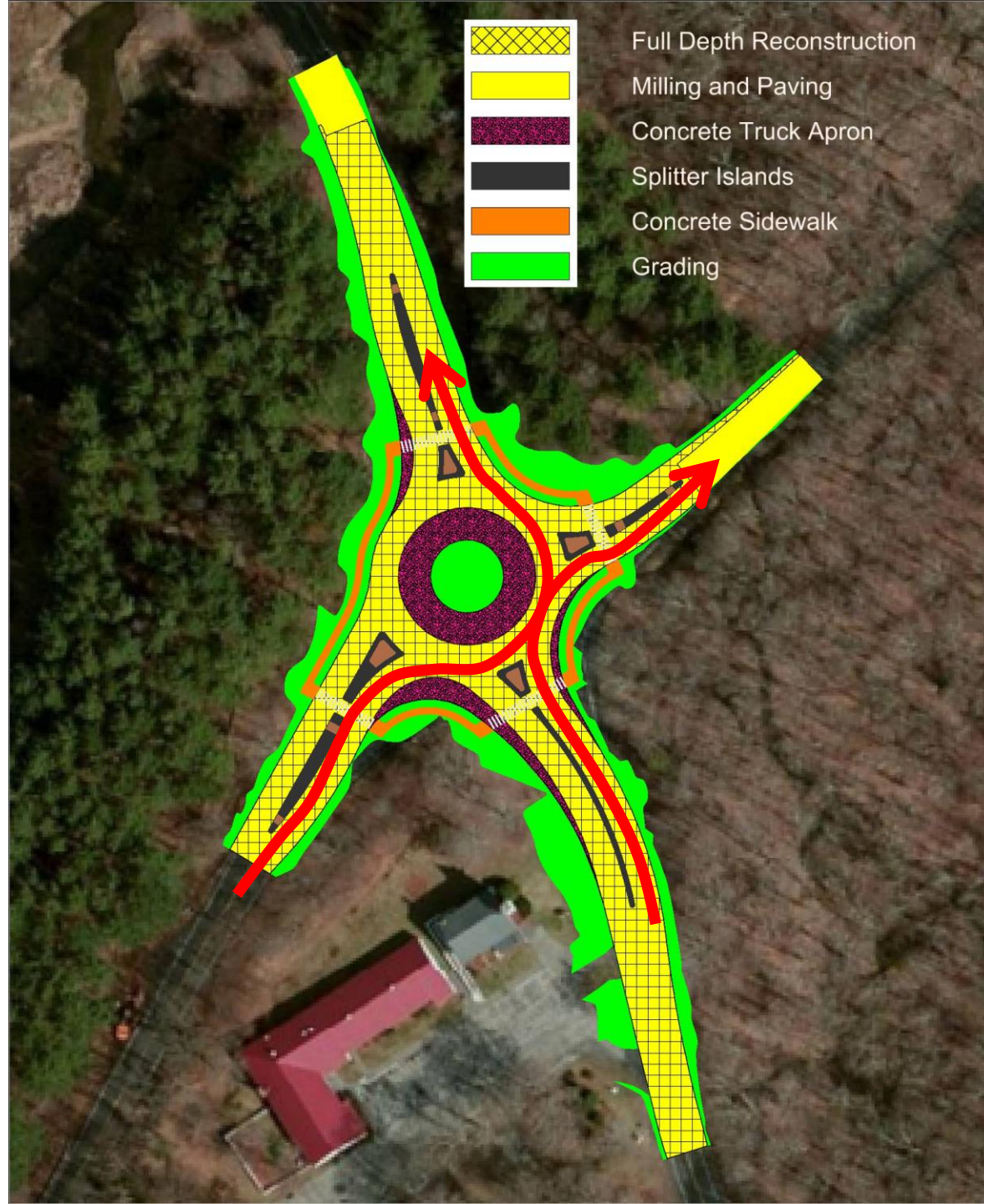
- Low volumes
- Little to no deflection
- High speeds
- Poor sightlines
- Relatively few crashes, but most crashes involved injuries

Proposed Modifications



Proposed Modifications

Speeds
reduced to
17-21 MPH

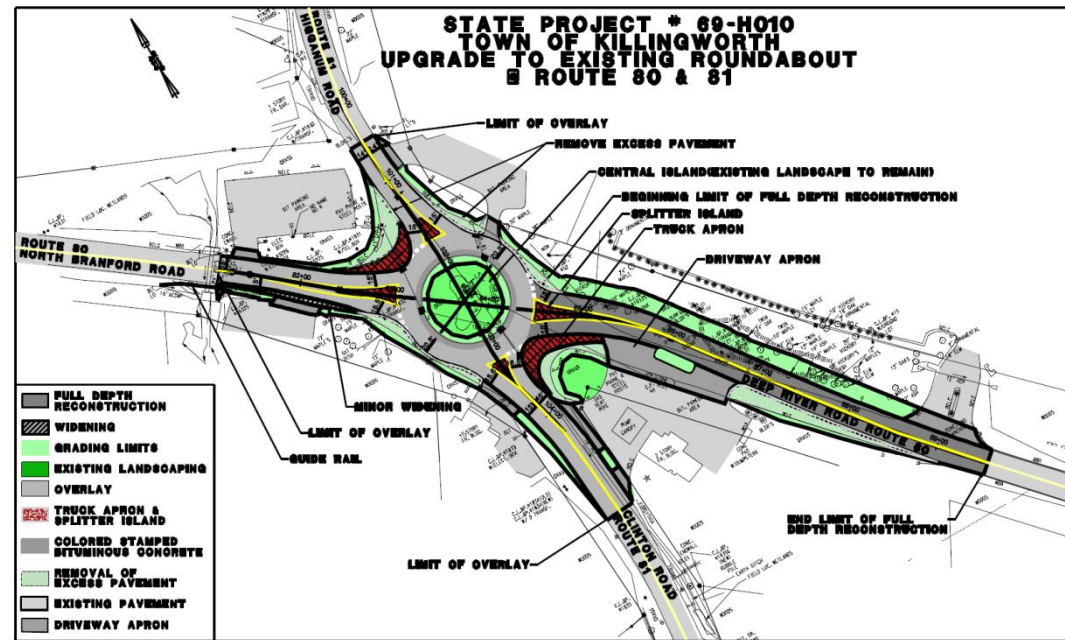


Seymour - Status

- Public Informational Meeting February 6, 2013
- No objections to design, questions about need, cost
- Used Killingworth safety results to show that benefits justified the costs
- Developed scaled down, lower cost version
- Town wanted to go with “full build” version
- Scheduled Advertising Summer, 2014
- Estimated Cost: \$2.5 Million

Summary

- Relatively low expense (\$1 - \$3 million)
- Comparatively simple design process
- Little/no Right of Way acquisition
- No change to current operations (other than reduced speeds)
- Significant safety improvements
- Plenty of “bang for the buck”



Thank You

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